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New trends in the analysis of coffee volatile fraction

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Aroma is an important 'signature" of coffee and one of the primary hedonic aspect in coffee evaluation playing a fundamental role in coffee choice [1]. The cup tasting is nowadays the most used criteria to define coffee quality also in the industry, although it requires a well-trained and aligned panel.

The fundamental studies on the chemical composition of an aroma are nowadays based on the molecular sensory science/sensomics approach, i.e. a discipline that objectifies aroma and taste of a food on a molecular basis and still is the reference method adopted to identify and quantify the molecules responsible in general for a food flavor, and/or in particular for its aroma.1 This approach is however too time-consuming to be used in routine control, also in view of meeting the ever-increasing demand of controls the industry requires. A method complentary to sensomics has been introduced, sensometrics, which has the aim to provide an objective tool complementary to sensory evaluation mainly for routine use. Sensometrics is a bridge linking sensory properties to chemical information behind them, trying to correlate the sensory characteristics of a food aroma to its chemical composition via chemo-metric methods. Sensometrics is based on fast and automatic Total Analysis Systems (TAS) in combination with suitable statistical tools (unsupervised and supervised) affording the screening of a high number of samples that is mandatory to define representatively the diagnostic pattern of the aroma of a complex food matrix such as coffee. It makes possible a correlation between the scores of sensory analysis and the chemical profile or fingerprint of a matrix obtained by on-line combining automatic high concentration capability sampling techniques with separative GC-MS (HS-SPME-GC-MS) or non-separative (HS-SPME-MS) platforms.

The effectiveness of the sensometric approach has here critically been studied to define a correlation between the sensory results obtained by a professional panel and the results of chemical analyses with the above platforms on a set of coffee characterized by highly different scores within each investigated sensory note (acid, bitter, woody, flowery, nutty, spicy)2,3. The two approaches can only be compared by considering their substantial differences, but the coherent results achieved in terms of repre-sentative compounds indicated the sensometric approach as a valid complementary and additional tool for the characterization of coffee through their aroma.

References

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